

ROMCAN – GENETIC EPIDEMIOLOGY OF CANCER IN ROMANIA

The ROMCAN Project (“Genetic Epidemiology of Cancer in Romania”) proposes a systematic evaluation of genetic risk factors associated with breast cancer in female (BrCa), colon and rectum (CRC), prostate (PrCa) and lung (LuCa) cancers, representing almost half of the overall burden of cancer in the country, in the Romanian population, aiming to define high risk groups for whom specific preventive measures can be implemented. We also aim to examine if there is any effect modification of the genetic risk by ethnicity, focusing on the Roma ethnic group.

The specific objectives of our proposal are the following:

- To establish a bio bank with biological samples, lifestyle-, demographic- and clinical data for a total of up to 4,300 cancer cases and 1,450 controls from the Romanian population;
- To catalogue the genetic variation in the biological samples collected in objective a), using a high-content genotyping chip and imputation of un-genotyped variants;
- To assess the association between genetic variants and LuCa, BrCa, CRC and PrCa risk and disease phenotype;
- To identify high-risk mutations underlying BrCa and CRC by whole-exome (or whole genome) sequencing of 100 unrelated cancer cases with family history of the disease (50 BrCa, 50 CRC).
- To assess whether environmental/lifestyle risk factors and ethnicity modify genetic susceptibility to LuCa, BrCa, CRC or PrCa;

At the end of the project, we will have created a unique database and biobank for cancer research in the Romanian population, including an assembly of a nested case control study of Roma ethnics. Collectively, these studies will lead to a better understanding of genetic susceptibility to cancer in Romania and will have immediate use for screening in high-risk families. The project results will catalogue the population frequencies of common genetic variation in Romania which is of use for other geneticists in the country. Last, but not least, the project will raise the profile of cancer research in Romania at the international level and increase the possibility of attracting additional funding. In the long-term, this research on the epidemiological and genetic causes of cancer will be useful for policy makers and may impact strategies to lessen the burden of cancer towards improving public health.